

## BULLETIN

The energy and planning resource for Western utilities

## LAKOTA NONPROFIT PLANS SUSTAINABLE COMMUNITY ON PINE RIDGE RESERVATION

**T**hunder Valley Community Development Corporation (CDC) is inviting one of the poorest communities in the nation to try a very different approach to economic development, one that takes time, commitment, willingness to learn and above all, planning.

## FROM THE GROUND UP

The grassroots nonprofit organization in Porcupine, S.D., recently released its ambitious plan to create a sustainable model community on a 34-acre parcel on the Pine Ridge Indian Reservation. Building a Regenerative Community envisions more and better housing on the reservation, increased local business opportunities, a skilled workforce and a healthy, supportive environment for residents. Those goals are challenging enough for communities with a developed infrastructure and large population. But Pine Ridge doesn't have either, admitted Thunder Valley



Students and tribe members are collaborating through the Native American Sustainable Housing Initiative to improve housing conditions on the Pine Ridge Reservation and other tribal lands. (Photo by Thunder Valley Community Development Corp.)

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Executive Director Nick Tilsen. "We are basically starting from scratch," he said.

By "scratch," Tilsen means that the Thunder Valley community must produce its own electricity, manage its own water supply and build roads to connect it with the rest of the reservation and beyond. Training local workers to build the community is part of the plan, too, since the nearest large labor pool is 100 miles away in Rapid City.

Having nowhere to go but up has some advantages. The CDC is free to embrace innovative development approaches that don't rely on an

abundance of resources. Proposed projects, such as a water treatment system that returns clean water to the aquifer, could make Thunder Valley the envy of more established cities.

Tilsen acknowledged that being the first adopter has its downside, though. "We are asking bureaucracies to do something they have never done before, and that creates a lot of interest," he said. "But these agencies have built regulations around one way of doing things. It is going to take time to find a way around those barriers."

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## PUBLIC WEIGHS IN

Although it lacks the tax base to build infrastructure, Pine Ridge Reservation has engaged citizens who want a better future for themselves and their families on tribal lands.

The project grew out of the yearly Thunder Valley Sundance, when organizers and participants found themselves discussing the many problems facing native youth. The idea of creating a local nonprofit organization to address social, economic and cultural issues took root. After community outreach to set priorities and gain residents' buy-in, the Thunder Valley CDC formed and attained nonprofit status in 2007.

Community involvement continued over the next six years as tribe members attended a series of listening and visioning sessions, town hall-style meetings and stakeholder design charrettes. The meetings produced the main objectives for a regenerative development that focused on creating a low-impact, self-sufficient community where people could live and work and continue their culture and traditions.



Tribe members participated in listening and visioning sessions, town hall-style meetings and stakeholder design charrettes to identify the goals and objectives for the Thunder Valley community. (Photo by Thunder Valley Community Development Corp.)

## PARTNERS, FUNDING LINE UP

A conceptual master plan, based on the main objectives, began attracting partners and funding to the Thunder Valley Regenerative Community. Oglala Lakota College (OLC), University of Colorado (CU) School of Environmental Design and the South Dakota School of Mines and Technology entered into service learning partnerships with the CDC and the Oglala Sioux Housing Authority. The partnership is exploring sustainable, affordable housing prototypes. "Thunder Valley is going to be a living laboratory," noted Tilsen. "It offers academic institutions a clean slate for learning, research and study and evaluation."

Several programs in the Department of Housing and Urban Development (HUD) provided the project with funding for planning, land purchases and construction. The CU School of Environmental Design also received a HUD grant to research sustainable housing models on Pine Ridge. The Environmental Protection Agency, Administration for Native Americans and Department of Agriculture (USDA) also contributed funding to small

projects within the overarching plan.

Last May, Thunder Valley CDC brought its partners together for a workshop aimed at integrating all the facets of the plan in a final report. Within the context of population, density, land use, building types and infrastructure; a roadmap emerged to provide affordable, efficient homes; produce all energy onsite; clean all wastewater onsite and create a vital, new Lakota-grown economy.

## A PLACE TO LIVE, WORK

The master plan includes office and industrial space, recreation and social service facilities, a market, food gardens, community gathering areas and water treatment facilities. Expanding workforce housing on the reservation, however, is top priority. "Between five and six thousand people work on the reservation, but only 2,500 to 3,000 people live here," explained Tilsen. "We have no rental stock, so 51 percent of our workforce commutes from outside towns. People tend to spend their paychecks where they live, so wages generated on the reservation don't stay here."

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## ENERGY SERVICES BULLETIN

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Phase I of the project focuses on building 31 single-family homes, with the help of the future homeowners. This strategy makes the home more affordable for the owner who is able to contribute up to 60 percent of the labor. The “sweat equity” model also builds marketable skills locally—and something more. “Helping to build your own home is empowering,” observed Tilsen. “It will give homeowners a feeling of accomplishment and self-sufficiency, and knowledge they can share with their community.”

### EFFICIENCY FIRST

Low energy use is central to both self-sufficiency and affordability. The Native American Sustainable Housing Initiative (NASHI), a joint research project with CDC’s academic partners, seeks to determine what type of building technology will prove most efficient on the reservation.

Students from CU and OLC are building four houses: one with conventional framing, and one each using insulated panels, straw bale construction and compressed-earth blocks. Sensors will be placed throughout the homes to see which style is most efficient at least cost. The answers are not as clear as they might seem, added Tilsen. “Straw bale buildings may not need much energy to heat and cool, but local farmers don’t practice small baling, so the material has to be shipped in,” he said. “Sustainability isn’t just one thing. It’s a big picture.”

In the big picture, Thunder Valley is being planned as a net-zero energy community. The absence of a pre-existing infrastructure will actually make it easier to build in efficiency. Planners can site buildings for optimal solar panel angle and daylight harvesting, and install efficient systems like ground source heat pumps and gravity-fed, decentralized water treatment. Making thermal materials



This recently completed straw bale house is part of a research project by NASHI to determine what type of construction technology best meets the needs of Pine Ridge residents and the goals of the Thunder Valley plan. (Photo by Thunder Valley Community Development Corp.)

and insulative construction systems standard building practice will further reduce energy requirements.

### DEMOCRATIZATION OF ENERGY

The master plan relies primarily on rooftop solar arrays to meet most of the community’s energy needs. “But biomass and wind have good potential, too,” Tilsen added.

A large wind turbine on a hill near the community would supplement the solar generation. Small individual wind turbines installed on office buildings and solar panels in parking areas could meet increased electrical demand in the future. The CDC is exploring leasing roof space to the community and other possible financing models. “We believe that it is critical for the community’s economic development and stability to own and produce the energy we consume,” stated Tilsen.

A micro-grid system is planned to tie into the rural utility grid that now supplies electricity to the reservation. The Oglala Lakota tribe receives an allocation from Western through LaCreek Electric Association, Black Hills Electric Cooperative, Nebraska Public Power District and West River Electric Association. Remaining connected to the grid would provide Thunder Valley with backup power in case of an outage. The community would also be able to offset some costs by selling excess generation and greenhouse gas credits through the utilities.

### UPS, DOWNS AHEAD

At a time when developers toss up new neighborhoods in a matter of months—or weeks—Thunder Valley CDC expects to take years to complete the planned community.

Having completed the preliminary engineering study and environmental assessment the CDC is now working with USDA to create an application process for potential homeowners to apply to build their own homes in the development. Developing permitting documents for infrastructure and buildings, and establishing a property management company and a homeownership training program are all part of Phase I.

The tribe will also be applying for several grants related to rural and tribal infrastructure. Growing this partnership is especially important to the CDC because it will help spread the benefits and lessons of Thunder Valley beyond the development itself. “Not everyone on the reservation is going to want to live in the planned community,” explained Tilsen. “We have to find ways to use what we have learned to lift up the whole tribe.”

The goal, and the stakes, for Thunder Valley Regenerative Community are clearly higher than those for most planned developments. The CDC has taken the first steps on the long journey to true sustainability, and is prepared for the odd side trip and dead end. “We will learn as much from our failures as we will from our successes,” Tilsen stated. “You can’t build something new overnight.” ⚡



## CURTIS, NEB., BOASTS 'BEST-TASTING WATER'

**T**he winner of this year's Great American Water Taste Test, held Feb. 12, is Western customer Curtis, Neb., population 935.

The National Rural Water Association presents the competition as part of its annual Rural Water Rally. The event draws members from 49 states and recognizes the importance of water to the nation's small, rural towns. Water is the lifeblood of these towns that shoulder the outsized responsibility for a large portion of America's food- and energy-production capacity.

Judges came from the Department of Agriculture Rural Development office, the White House Office of Management and Budget and other programs.

### NATURALLY GOOD

Interestingly, water treatment is not a big load for Curtis, which gets its

power through the Municipal Energy Agency of Nebraska. "It's not a load at all," explained City Manager Doug Schultz. "We don't have to treat what comes out of the ground. The water has very low mineral levels naturally, and it tastes so good we don't want to ruin it with chlorine."

Curtis also has some of the cheapest water rates in the country. Schultz attributes the low rates to efficient employees and councils that have made wise investments in the town's system over the years.

### SERIOUS ABOUT WATER

Like the other towns competing in the taste test, Curtis has an economy based primarily on agriculture. The municipal utility's biggest customer is Ag Valley Cooperative Association, a regional grain handler. "Most of their product is irrigated corn," Schultz observed.

In fact, the local tax base is dependent on irrigated land, he acknowledged, making water quality and use the region's biggest issue.

In Curtis's zoning area, however, there only a few wells, and the town is home to the Middle Republican Natural Resources District. "NRDs are responsible for protecting soil and water resources, so they work with the growers on irrigation efficiency programs," Schultz said.

That frees up the municipal utility to do what it does best: provide delicious and low-cost water to its residents. Western congratulates Curtis on its recognition and raises a glass—of water—in the town's honor. ⚡



The water in Curtis, Neb., tastes great, no treatment required. (Photo by City of Curtis, Neb.)

## AROUND THE WEB: LED STREETLIGHT RETROFIT CALCULATOR

In just a few short years, LEDs—light-emitting diodes—have jumped from being a specialty product to being the standard for new lighting. From small towns like Fountain, Colo., to megalopolises like Los Angeles, municipalities are updating their public spaces with highly efficient, easy-to-maintain LED streetlights.

There are many reasons for cities to consider upgrading public lighting to LEDs. According to the Energy Department, the United States could avoid 1,800 million metric tons of carbon emissions by switching entirely to LED lights over the next two decades. Municipalities with Dark Sky ordinances might choose LEDs that provide cutoff and semi-cutoff for compliant solutions.

When it comes to capital projects, however, the bottom line often carries the day, and here, too, LEDs justify their installation. By reducing the cost of ownership, LED lighting quickly offsets the higher upfront costs of the technology. For example, Los Angeles estimates that the new streetlights will

reduce its annual electric bill by at least \$7 million, and save another \$2.5 million through reduced maintenance needs.

Still, every case is different, so before presenting a proposal to your city council, get the hard numbers from the LED Universal ROI [return on investment] Calculator. Developed by Street Lighting Equipment Corp., this calculator gives payback time, both the annual and life-time savings for energy, maintenance and carbon dioxide production. You can also use it to calculate return on investment for other types of lighting technology.

The cost of LED fixtures continues to drop as the technology improves, so high-efficiency streetlights are



increasingly within the reach of many municipal budgets. Visit the ROI calculator today to find out what LEDs could do for your city's operating costs. If the results look good (or great), you may not want to wait for the next round of capital replacements. Funding for retrofit projects may be available through your state energy office or the U.S. Department of Agriculture Rural Development Program. You can also search Grants.gov for federal grant opportunities. ⚡

## AGENDA JUST UPDATED FOR 34TH UTILITY ENERGY FORUM MAY 14-16; TAHOE CITY, CALIF.

Make your plans now to participate in one of the best annual networking and learning opportunities in the utility industry. Check out the recently updated agenda for the 34th Utility Energy Forum, scheduled for May 14-16 at the Granlibakken Conference Center in Tahoe City, Calif.

Utility professionals from around the West will be sharing their strategies for modernizing approaches and leveraging consumer interest in energy efficiency and renewable energy. Expect frank discussions about what works, what doesn't and where the programs go from here.

Attendees will explore trending issues from the point of view of policy makers, including Western Administrator Mark Gabriel, large customers and researchers. Presentations will cover new technologies for reducing energy use and demand. More than 20 exhibitors have already signed up to introduce valuable products and services.

The Utility Energy Forum is, most of all, a networking and professional development event for mid-level staff of energy utilities who deal with customer programs related to energy efficiency, renewable energy, key account management and customer service. Although it targets utilities

serving Western states, anyone involved in delivering energy-efficiency or demand-management programs will benefit from attending.

Western and several of its customers are sponsoring this meeting. Sacramento Municipal Utility District, Roseville Electric, Imperial Irrigation District, Modesto Irrigation District, City of Palo Alto Utilities, Riverside Public Utilities and Truckee-Donner PUD are all supporters of the Utility Energy Forum.

Join these leaders in utility energy program development, and meet your next program partner or mentor in Tahoe City. Register before March 14 to receive the early-bird discount. ⚡

# ACEEE ANNOUNCES THE FIRST INTELLIGENT EFFICIENCY CONFERENCE

**NOV. 16-18, 2014; SAN FRANCISCO, CALIF.**

Intelligent efficiency (IE) is a systems-based approach to improving device, process, facility or organization performance, using affordable next-generation sensor, control and communication technologies. The American Council for an Energy Efficient Economy (ACEEE) estimates that the annual energy cost savings of IE technologies for the commercial and manufacturing sectors could exceed \$50 billion.

Achieving this outcome will require collaboration among the efficiency, technology and user communities, including the utility industry. To date, these largely distinct communities have had few interactions beyond speakers from one group addressing assemblies of the other.

To explore this untapped source of energy savings, ACEEE is convening the

first Intelligent Efficiency Conference in San Francisco this fall. Thought leaders and innovators will update attendees on what is happening in this rapidly evolving field. Diverse stakeholders will have the opportunity to share ideas and form partnerships that can advance adoption of intelligent efficiency in the marketplace. The event will serve as a crucible for forming new policies, program strategies and commercial ventures.

The ACEEE Intelligent Efficiency Conference is designed specifically for:

- Energy-efficiency program developers and administrators
- State and local government policymakers, staff, and associations
- Chief technology officers and chief information officers

- Service providers
- Investors
- Entrepreneurs
- Hardware and software developers
- ICT solution providers
- Building automation providers
- Smart manufacturing, smart transportation, smart buildings and smart cities leaders

Speaking roles are by invitation only; however, ACEEE welcomes suggestions for presenters and topic ideas. Sponsorship opportunities are also available. Contact the IE program team for more information, and visit the Intelligent Efficiency web page for updates about the program and registration. ⚡

